DOCUMENT RESUME

ED 203 343 CS 206 373

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TITLE A Case Study of Electronic Editing and News Decision Making.
PUB DATE Aug 81
NOTE 37p.: Paper presented at the Annual Meeting of the Association for Education in Journalism (64th, East Lansing, MI, August 8-11, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Communication Research; *Display Systems; *Editing; Electronic Equipment; Journalism; Layout (Publications); *Newspapers; Newswriting
IDENTIFIERS *Cathode Ray Tube Terminals

ABSTRACT

A study was conducted at two major midwestern newspapers to ascertain the effects of video display terminal (VDT) use on the work and perceptions of copy editors. The methodology consisted of observation of one full day of copy desk work at a VDT by a single local news desk copy editor and one full day of work at VDTs by a regular weekday shift of copy editors on the national/international news desk, as well as interviews with various editors. Data obtained through the interviews were validated by means of a content analysis of published material from two years before and two years after installation of the electronic system. The major conclusions drawn from the case study were as follows: (1) copy editing was done much the same way with a VDT as with pencil and paper; (2) adaptation and adjustment time to VDT editing systems by copy editors need not be lengthy; (3) the electronic editing system has contributed to the editing process by reducing routine tasks such as headline and story counting; (4) except during the adjustment period, the electronic editing system did not appear to be a factor in news judgments and decision making behavior for editors; and (5) while accuracy seemed to be enhanced by electronic editing systems, the issue of editing speed remained unresolved. (HTH)

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Photojournalism Division and
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A CASE STUDY OF ELECTRONIC EDITING AND NEWS DECISION MAKING

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A paper presented to the Photojournalism Division and the Graphics Division, joint research session, Association for Education in Journalism, annual convention, Michigan State University, East Lansing, August 8-11, 1981.

CS206373

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A CASE STUDY OF ELECTRONIC EDITING AND NEWS DECISION MAKING

Without question, the newspaper industry experienced a set of vast technological changes in the 1970s with incorporation of the computer into composing rooms and newsrooms. Computerization of newspapers has affected all departments, from circulation to advertising to news and editorial. While this is an on-going change, one which appears far from complete, its effect is beginning to be evaluated. The VDT has moved into newspapers of all sizes across the United States. Most publishers and editors acknowledge that the video display terminal will be the basic component in the newsrooms of the 1980s. And a 1980 American Newspaper Publishers Association Research Institute equipment report indicated there are 21,688 VDTs already in use and 2,122 computers in operation at ANPA-member newspapers.[1]

Electronic systems for newswriting and copy editing are connected with photo-composition hardware for greater speed and accuracy in the production and editing processes. Traditional copy flow systems were set up to include typing by a reporter and re-typing by a printer at the keyboard of a linotype machine. New VDT-electronic editing systems eliminate this second error-prone keyboarding task. Reporters and editors are now, in effect, setting their own copy into type. The original effort to type a story on the keyboard of a VDT is often the final effort, with the exception of any editing revisions. Stories are stored in computer files, called queues, until a reporter calls it up for additional work, or an editor decides it is time for a copy editor to process a story. Because these modern systems have brought an additional task to the newsroom---the final typesetting and proofreading responsibility---

reporters and editors exercise additional caution to guarantee the accuracy of the final product before it moves electronically to the composing room. This is only one of many influences the new hardware exerts on the newsroom. It is clear, too, that copy editor decisions take on an added dimension of responsibility.

Scholarly interest in computerized electronic writing and editing systems is developing, but existing literature, even at the exploratory level, is scant. Researchers have studied the decision-making processes of copy editors and slotmen---key gatekeepers in the newsroom--- but most of the literature does not consider at depth the potential effects of this technological variable. Some studies addressed certain variables in the evaluation of newspaper technology, such as Teletypesetter (TTS) tape system circuits in the 1950s, but research in the last decade generally does not consider the ramifications of new technology such as development of the video display terminal.

The mass media has entered an age of sophisticated word processing. A major function of the mass media in society has been to collect, process, and transmit information from sources to individuals in the community. Historically, this has been the perogative of the newspaper; however with the development of the electronic media, competing channels have become available. Social research on this transmission activity has focused on the communicator, the message, the channel, and the effects of the message. Scholarly interest in gathering, processing, and transmitting information has resulted in a series of research studies on the mass media gatekeeper and the process of gatekeeping. A gatekeeper obviously makes many decisions in performing his task. The research in gatekeeping has centered on individual gatekeepers' behavior patterns. Early studies focused through case studies on biases and perceptions or on audience needs. More recently, investigation has

focused upon the organizational contexts of gatekeeping. Increasing concern for broadcast news gathering techniques has taken research attention on gatekeeping into radio and television newsrooms. Yet there are many changing factors in the newspaper newsroom such as the new electronic editing systems which demand that attention return to newspapers. No thorough investigation into the impact of the principle component of electronic reporting and editing systems has been conducted. Systematic evaluation of the types of decisions which must be made by gatekeepers and how these decisions are made with new electronic editing systems deserves scholarly inquiry. The problem, then, is to explain the decision making of gatekeepers who process information on electronic editing systems.

The purpose of this study was to examine the use of the major element of the electronic editing system, the video display terminal, by one key gatekeeper, the copy editor. At the outset, many general questions existed to guide the research. For example, what were copy editors' perceptions regarding their adaptation to the new technology in their newsroom? What, in general, were the attitudes of copy editors toward VDT systems? What was the nature of the decisions made by a copy editor using a VDT?

The majority of copy editing literature is contained in the broader body of literature on gatekeeping. This literature consists generally of case studies of newspaper and broadcast gatekeepers. Investigators have chosen to focus on one or more aspects of gatekeeping in their research; however, only a few studies emphasize the same variables in gatekeeper decision making. Even less scholarly attention has been given to copy editors as gatekeepers. White introduced the term "gatekeeper" into the literature of journalism,[2] taking it from sociology. Geiber's case studies of Wisconsin gatekeepers used similar case study techniques in studying the decision making of journalists.[3] But as has been pointed out, one of the least considered factors is the impact of technology. Early literature on electronic editing focused on technological development of the VDT

and other hardware in a non-quantitative fashion. Shoquist, for example, discussed the personnel problems in adjusting to the new systems.[4] He wrote that editors and reporters with proper orientation should have no serious problems and cited a similar experience by editors at The Detroit News who stated that after adjustment, there should be no personnel difficulty. Sutphin reported a number of advantages and disadvantages of VDT use, noting that copy is more error free, there is no transmission error, copy is neater, and the process becomes faster.[5] He argued, on the other hand, that the major problem is loss of copy electronically through no fault of the operator. Doebler noted that VDTs were "easier to use in manipulating copy," which leads to savings in time and money.[6] Another influence, he wrote, is later editorial deadlines which permits more extensive creative work toward content improvements. Shoquist pointed out that the appearance of error-free copy is deceptive: "A perfectly typed story may look great, but it may be a lousy story. The old smudges and crossouts and sloppiness of copy paper that often signaled bad writing are no longer present."[7] He also argued that the greater control over copy given by an electronic system is a mixed blessing since the copy editor becomes the final typist and proofreader. And Shoquist advocated use of hard copy, or printer copy, with an electronic editing system on the copy desk.

Stulce found that across three news story classifications--- local story, single wire story, and combined wire story--- copy editors experienced positive effects from the electronic system. She wrote, "there were fewer errors, both grammatically and typographically, for the three story classifications . . . . Moreover, editor efficiency appeared to be increased in some areas."[8] Crook evaluated the impact of the new editing technology on student editing by dividing students into two groups--- one using traditional pencil and paper and the other with VDTs --- to find that (1) students edit equally skillfully on punctuation and redundancy

exercises with the VDT and pencil and paper techniques, (2) students using the VDT require greater time to complete stories, and (3) with a time factor included, students using the traditional method fared significantly better overall on both types of exercises.[9]

Editing accuracy suffers as the result of VDT editing, a study by Bennett, Murray, and Stempel reported.[10] Testing the VDT against pencil and paper editing, Bennett, Murray, and Stempel set a fixed time for the editing task. The data indicate a higher error rate mean for the VDT, consistent with Crook's findings. Editors with pencil and paper also had a tendency to shorten the story more, Bennett, Murray, and Stempel found.

Lindley noted two effects of the new technology. First, the VDT allows copy editors to make extensive changes in all copy, including copy which formerly came from wire services through TTS systems.[11] It encourages local modification for style, for example. Second, Lindley said the VDT gives a copy editor more autonomy in that it has been more difficult for a slot editor to determine what has been changed on a VDT screen--- a point raised by Shoquist. Previously, hard copy had to be edited by pencil and paper and modifications were clearer. Lindley also pointed out that with automatic story measurement by the computer, fewer "wild" trims are made, and copy fitting is more precise and cautious.

Fisher conducted a series of tests determining that the copy editor using pencil and paper was slightly faster than the copy editor using a VDT.[12] On simple articles, the difference in editing time was greater than on lengthier, more difficult articles, Fisher said. He wrote, "It appears that VDT editing is just about as effective as pencil, both for speed and accuracy . . . . We had anticipated that the VDT editor might be measurably less efficient than with the pencil. He is not."[13] Fisher also reported that newspaper editors perceived editing

speed overall to be increased and quality to be improved by the VDT.

In contrast to Fisher, Kurtz stated that electronic editing systems slow editing because VDT editing requires greater manual dexterity than pencil and paper editing.[14] While he argues that the VDT has altered the role of the editor and shifted control to the newsroom, he says the VDT requires closer scrutiny of copy for errors. Among Kurtz' conclusions is that the VDT leads to a sentiment among publishers that hard copy is no longer essential and will become obsolete. Editors in his study found electronic editing systems improve typographical accuracy, but smaller newspapers generally felt the extra proof-reading task was an unwanted burden and it actually increased errors. Kurtz determined that the major complaint of VDT users centered on insufficent capacity for storage of copy and an inadequate number of terminals in the newsroom.

Shipley, Gentry, and Clarke found that "the vast majority of editors, when given a chance, prefer VDT editing to pencil and paper; an overwhelming majority 'like' working with VDTs."[15] They noted that the level of experience as a copy editor has a minor effect on speed and accuracy, but those with positive attitudes seemed to work faster than those with negative attitudes toward the VDT.[16] Another survey of editor attitudes toward the VDT underlines that editors are somewhat divided on whether editing speed is increased or decreased. A majority believed that editing quality is improved with an electronic system. Findings also indicated that most final editing is performed on a terminal, and that the majority of newspapers did all editing at a terminal rather than a combination of conventional and electronic methods.[17]

Wolton argued that new editing and reporting technology raised rarely asked questions, and he wrote, "I found, for example, that while the physiological effects of working with VDTs have been studied, the effects of their introduction on the nature and organization of journalistic work have not."[18] Wolton also con-

tended that the "increasingly technical role journalists play not only upsets the traditional organization of the work process and calls the news product into question; it also alters the division of labor . . . ."[19] Since it is central to the work in this paper to determine the effects of technology on editing behavior, Wolton's inquiry is central to this study. He wrote:

> We must also learn to perceive the various levels at which technology is altering the world. I encountered many descriptions of technology's global impact, but a silence . . . about any changes in the very nature of information itself. Simultaneously, therefore, I was being told that the new technology 'changes everything' and that 'it changes nothing.' VDT editing . . . is presented both as a revolution and as merely a supplementary tool that can be introduced without modifying the organization of work or the intellectual content of the product.[20]

Research Questions

From the literature, it becomes apparent that technological developments have potential effects upon the decision-making behavior of editors. Early literature, as well as recent work on electronic editing and reporting systems, has investigated various aspects of this matter, leading to these research questions for this paper:[21]

(1) What is the nature of the decision-making process of copy editors using the VDT while editing copy?

(2) What are the copy editors' perceptions of the gatekeeping process when using an electronic editing system?

(3) What, in general, are copy editors' perceptions of the VDT and decision making which occurs while editing at a VDT?

(4) What are copy editors' perceptions of their adaptation to electronic editing technology in the newsroom?

(5) Do copy editors perceive effects on the length of stories which are the result of VDT editing? How is headline writing affected by VDT editing?

(6) Do copy editors perceive a change in published news coverage in terms of the ratio of local news to non-local news? Does the content of the newspaper reflect a change after the electronic editing system was installed?

(7) Do copy editors perceive any effect on the number or type of news judgment decisions made during copy editing on a VDT?

(8) Do copy editors perceive any change in the accuracy of their editing with use of a VDT? Any change in the quality of their editing skills brought on by use of a VDT?

(9) Do copy editors perceive changes in speed in editing on a VDT? In terms of production speed, do editors perceive or know of deadline changes caused by the electronic editing system?

Method

The Milwaukee Journal, regarded by authorities as one of the nation's leading newspapers, was chosen to study because it operates one of the largest electronic editing and writing systems in the newspaper industry. The Milwaukee Journal and Milwaukee Sentinel, which publish under common ownership, depend on four Hendrix 3400 systems which became operative on May 24, 1976. At the time of this study, there were seventy-four VDTs in The Journal newsroom and forty-seven VDTs in the Sentinel newsroom.[22] The Journal news copy desks--- divided into metropolitan, state, and national/international desks--- use twenty-three VDTs for approximately thirty-five copy editors and news editors. Some copy editors had as much as two and one-half years experience using this particular system at the time of the study and were able to provide greater insight than those at a newspaper still experimenting with a newly installed system. The case study approach to gatekeeper decision-making behavior has been employed by numerous investigators.[23] Investigation of The Journal took three

convergent methodological forms: (1) field observation, (2) semi-structured or standardized interviews, and (3) content analysis.

Denzin describes the investigator-observer as a "participant as observer."[24] Unlike the complete observer, who does not reveal his or her identity, the participant observer does reveal his or her identity during observation. Participant observation included field research with (1) the observer recording one full day of copy desk work at a VDT by a single local desk copy editor, and (2) the observer recording one full day of copy desk work at VDTs by a regular weekday shift of a full desk of copy editors on the national/international desk. Grey used this observation approach to study decision making of a reporter covering the U.S. Supreme Court, arguing that it demands that researchers look at how people make decisions--- that is, what factors are involved in decisions.[25] Grey's investigation looked closely at the reporter and analysis was based on the argument that observation provides insight into the process of how the newsman makes decisions about what a court has ruled.[26] A specimen record was made by watching editing behavior and reporting it on a schedule.[27] To lessen possible obtrusiveness of the observer, a pretest was conducted under the pretext of being the actual observation. Afterward, other sessions were recorded. Pretesting occurred February 8, 1979, and national desk observation occurred February 10, 1979. The local desk observation of a single copy editor took place February 13, 1979. The primary objectives were to record directly observable behavior during the editing process and record observer impressions about copy editors' perceptions, motives, and feelings. Observation occurred during normal production periods.

The second methodological form, the semi-structured interview, has been given extensive discussion in the literature. Maccoby and Maccoby, for example, wrote that the structured interview provides consistent, comparable information.

Others have noted that the interview in unstructured form provides an informal atmosphere conducive for responses.[28] Interviews were conducted and recorded on tape in a private office just off the newsroom of The Journal. Responses were obtained from copy editors working on the metropolitan desk, the state desk, and the national desk as well as from the desk editors, three assistant news editors, the news editor, and managing editor--- a total of thirty-one interviews of about thirty to forty-five minutes each. Interviews were conducted between January 10 and 31, 1979, with only one copy editor refusing to cooperate and a second being out of town during the period. The interview schedule was pretested using full-time copy editors at the Milwaukee Sentinel between December 29, 1978 and January 3, 1979. The original interview schedule went through two revisions: after pretesting the second version was created. Approximately halfway through interviewing, the second revision was modified slightly.[29]

Since several of the research questions must be answered through analysis of content of the publication, content analysis was used. This procedure affords validation of perceptual data obtained through interviewing. Because the system at The Journal had been operative for two and one-half years at the time of the study, published content for two years prior to installation and two years after installation was analyzed. For analysis, only the main news, local news, and Accent sections were included in final edition form since all other sections of the newspaper were produced by independent copy desks. During the four-year period, a random sample of 104 dates was drawn. An equal number of pre- and post-VDT issues were analyzed.[30]

Findings

Research Question 1, The Nature of VDT Decision Making by Editors: The chronologies in Figures 1 and 2 display the types of decisions made in deadline contexts. As indicated in Figure 1, copy editor Steve Maersch spent the

largest block of time text editing at his VDT, followed by time spent headline writing.[31] Thus, the decisions made generally relate to content of stories

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Figures 1 and 2 about here

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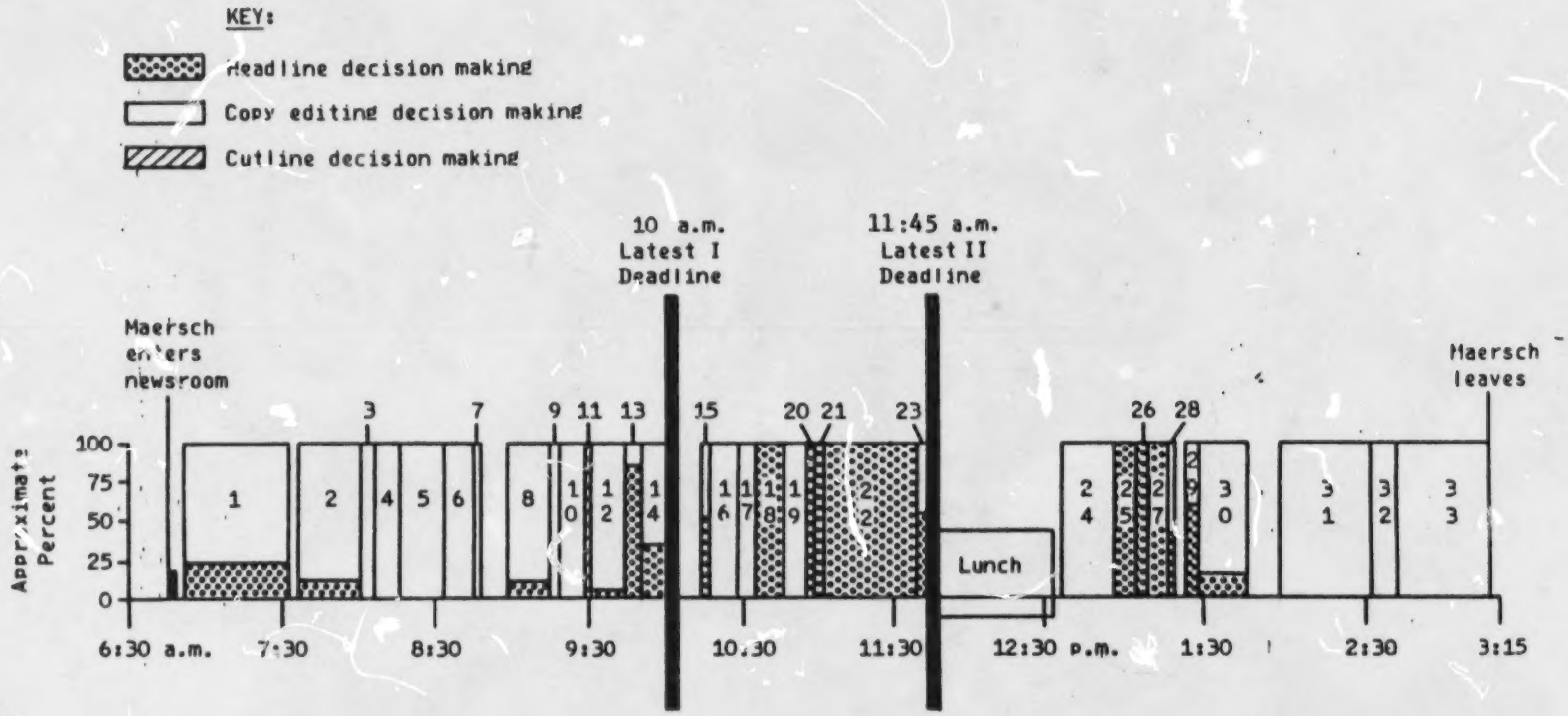
and not other aspects of copy processing. Comparatively little time was devoted to other editing tasks.

Because such a great proportion of decision making concerned copy content, further analysis of Maersch's editing was necessary. Fifteen stories were edited by Maersch which were made available to the researcher. These were edited by Maersch on the local desk, but originated from the wire services through the national desk.[32] Analysis of the stories indicates that the major decision making behavior of this editor concerned story shortening. But this should be viewed in the context that Maersch was generating filler material for the local section that day. A relatively easy goal to reach, Maersch did so by taking the fifteen stories of a mean length of 255.4 words and cutting them to a mean length of 43.9 words. Generally, story trimming was from the end of the story, although this was not an absolute pattern. Maersch appeared to make more story-length decisions than any others regarding story form. Decisions to change the story to conform to newspaper style were also numerous, however. Shortening decisions involved deleting entire paragraphs with the stroke of a single key, and deletion of sentences or phrases was equally easy; style decisions reflected usages peculiar to The Journal such as use of a percent symbol instead of the word. Maersch did less story reorganizing than shortening and editing for style, and, as expected, a low amount of rewriting. Maersch detected just two grammatical errors in the fifteen stories which he corrected, and three factual error corrections were made in the group of shorts. Maersch did not make any effort to combine ver-

Figure 1

VDT DECISION-MAKING TYPES

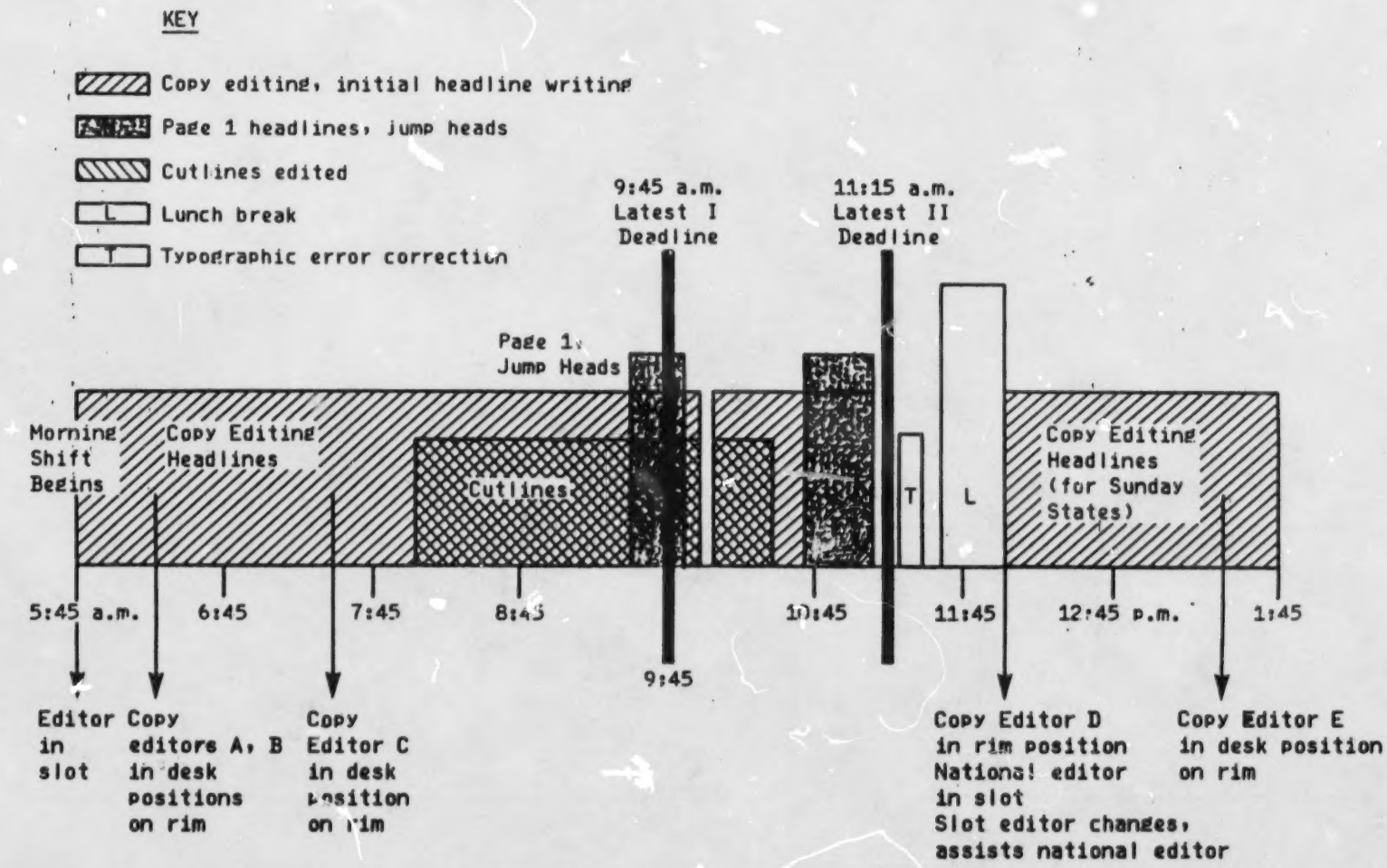


Code of Story Slugs edited by Maersch:

1 -- Shorts
2 -- Seeger
3 -- Lisbon
4 -- Bridge
5 -- Slinger
6 -- Clinic
7 -- Spin
8 -- Bits
9 -- Food
10 -- EAA
11 -- Cutlines
12 -- Clem
13 -- Food
14 -- EAA
15 -- Bit
16 -- Radio
17 -- County
18 -- Bit headline
19 -- School
20 -- Drugs headline
21 -- School headline
22 -- Local headlines
23 -- Adbit
24 -- Ethcol
25 -- Slinger headline
26 -- Clinic headline
27 -- EAA headline
28 -- Local short
29 -- Suit
30 -- Awards
31 -- Snowma
32 -- Bridge
33 -- Flowers

Figure 2

COPY EDITING AT THE VDT: NATIONAL DESK SATURDAY SHIFT



sions of stories, although in four of the fifteen cases he was provided multiple wire versions of a single story. Subheads were not used. However, during the observation, Maersch used subheads in stories long enough to warrant them---following local desk style.

During the observational period, Maersch encountered two deadlines and a pattern of editing tasks and decision making evolved. From Figure 1 it is clear that a large portion of Maersch's headline decision-making behavior came under deadline pressure. As on the local desk, time consumed on the national desk (Figure 2) is dominated by VDT copy editing of stories. Headline writing was second in amount of time, but it did not consume nearly as much time as was devoted to story content. Headline writing occurred during the shift, as stories were assigned. However, these headlines might be reassigned or rewritten if a story was selected for page one---the assumption being that none of the stories is placed on page one until the budget is considered by the news editor. Thus, a flurry of headline writing activity highlights Figure 2 immediately before each deadline. Copy editors working under deadline pressure are most frequently writing headlines and not editing copy. On the national desk, most copy content editing occurs in a non-deadline context. Cutline writing and cutline copyfitting required very little time, since the picture desk prepared cutlines. Figure 2 illustrates that copy editors spend little time in correction of typographic errors; only a single incident was observed.[33]

While circumstances prohibited gathering data involving all news handled by the national desk during the shift, data gathered from a selected sample of stories handled by copy editors are suggestive of the types of tasks performed during copy editing, and the time devoted to related decisions during the day. One major story per editor was content analyzed with respect to decisions about

content changes through the copy flow from rim person to slot to news editor. Data indicate that copy editors made more style change decisions and story shortening decisions per paragraph than any other editing task. However, the number of executed decisions was still less than one per paragraph on the average even for the most frequently performed tasks.

Furthermore, the data indicate that all significant change decisions are made from the original wire version transition to the rim editing version when the story is brought to the screen for the first time by an editor, and not in the intermediate steps from rim-to-slot or slot-to-news-editor gates. In two of the four stories analyzed, no change decisions were made in the second or third gates. Thus, data indicate that as copy flows from various gate to gate in the electronic editing system, editing decision making for change is significant at the first gate, but limited as is done in traditional systems at subsequent gates.

Research Question 2, Copy Editors' Perceptions of Gatekeeping: From interviewing copy editors, it is clear that gatekeeping in terms of the flow of copy from gate to gate is not perceived to be affected by an electronic editing system. Copy editors felt the only significant change in copy flow was physical. While copy editors noted very little change, one stated that the system seemed to require more time to move from step to step when the technology appeared in the newsroom. A "roving slot" was added to provide an additional slot editor for movement of copy near deadlines on the local and national desks and reduce the sluggishness in copy flow. Shoquist noted that the system was designed to remain unchanged in terms of copy flow.[34] Interview respondents noticed a change in the timing of the flow of copy, pointing out that the new system loosened the structure of the copy flow, creating logjams of copy near deadline for slot and news editors. Since the work of the news editor is evaluative in nature, much of the late rush is handled by "preview" readings permitted without disruption of editors by the

new system. Previously, an editor would only be able to determine the content of a story in preparation by reading over a shoulder of a copy editor. But the electronic editing system permits "reading" of stories without interruption of rim work.[35]

Another aspect of gatekeeping concerns use of hard copy available on wire service stories with the electronic versions in editing. Copy editors, in general, differentiated between the need for hard copy on the local, state, and national desks with many responses divided. Many of the group felt hard copy was necessary for state wire items, but not locally originated stories. One copy editor felt it was necessary on national desk stories because so many versions of the same story are provided by the newspaper's many wire services. Several other editors expressed the need for hard copy as insurance against possible electronic problems--- such as unintentional deletion of part or all of a story. National desk editors felt hard copy was essential in their work because of the complex work of combinations of two, three, or as many as a half dozen versions and write-throughs of versions to produce a single story.

Research Question 3, Copy Editors' Perceptions of Decision Making: Copy editors were probed during interviewing for general perceptions whether electronic editing had produced any overall effect upon the decision-making process. About half the group interviewed perceived some effect upon their decision making, but the remaining portion saw no difference attributed to electronic editing.

Copy editors sensing a change in their decision making offered a number of explanations, with the major reason that the system design facilitated content and headline experimentation and alteration. With this convenience, copy editors said they were more willing to consider decisions regarding content which may have been dismissed previously, and were more willing to execute these decisions

at their VDTs. One said that the system makes editors more willing to make changes and more willing to update stories much closer to deadlines. Some stories which are published through the computerized system would have never been considered using hot type. Another editor pointed out that the new system makes an editor more flexible and capable of a wider range of choices. These choices, he said, would be equally easy and therefore based on news judgment and not a technical prejudice. An assistant news editor stated that electronic editing makes a major difference in her ability to make news judgment decisions during the course of her duties since she is able to "preview" stories prior to their transmission to her queue.

A number of copy editors perceived a negative influence on decision making. These individuals felt the system was inhibiting and it slowed decision making and task completion. Other copy editors argued that when the system was new to them, they were extremely sensitive to the hardware, fearing a wrong keypunch would cause a system crash. One noted that she had to develop a "computer mentality" and this took time. Others pointed to the mechanical delays which can delay decision making or bring negative effects to the editing process---particularly during deadline periods. One said, ". . .it is slower, I am slower at it, and therefore if I am combining a number of different stories, just simply for speed's sake, I may tend to omit an element or two from some wire services that I probably should include."

Copy editors seeing no change in decision making argued that the technology should not have an effect on a "good" copy editor, and someone who has taken the time to learn the system and uses it efficiently. The problems which could exist, these individuals felt, were more likely to occur with new personnel or part-time desk assistance which would lack the regular use and familiarity with the system.

Research Question 4, Copy Editors' Adaptation to New System: Among the several considerations about adaptation to the "computer mentality" and the electronic hardware mentioned by copy editors are (1) additional responsibilities brought by the new system and (2) potential for diversion from editing behavior caused by the new system. These two considerations were discussed in interviews by editors.

The respondents strongly sensed a change in responsibilities, stating that the system had given additional responsibilities and this affected their work and adjustment to the new system. Most stated the change was in the area of proofreading copy since there would not be an additional reading in the composition stages after copy left the newsroom. The most significant change seems to be an additional reading in the editing process at the rim. Several copy editors stated they read a story not one additiona time, but twice when the editing tasks are completed---simply to search for typographical errors. Because they feel more responsible for the final product under the electronic system, the extra reading becomes part of the routine. An assistant news editor characterized the responsibilities as healthy ones to the editing process. Another editor said she felt the pressure, and is "probably inclined to look over a story once more before I send it over . . . . I make the time to do this, when there is time." Still another editor said she felt the added pressure of electronic editing at the outset but, after a period of adjustment, she no longer perceived an influence of the system in terms of adding responsibilities in editing.

Another consideration in adjustment is that concern for operation of the system may override concern for traditional considerations in the editing process such as readers' interests and other news values. Copy editors were divided whether or not attention to operation pre-empted attention to the news of the day. A group of the editors saw this occurring in their own

cases, and another equally large group felt operation of the system had not affected their overall editing. A third group, not as large as the first two, believed diversion occurred during their first few weeks of VDT editing as they were becoming accustomed to the system. This effect soon "wore off" and was no longer an influence on decision making, they stated. One argued, "This could have been said in the first week or two when the system was brand new and you're thinking of how to make this damn machine work. It might have sidetracked your mind, but I don't think it would be a valid criticism once you learn how to operate the system . . . . You can only think of so many things, so if you are worried about how to make this machine work, then you might overlook other things." And another editor felt it made a difference in the beginning, but not after the adjustment period.

Research Question 5, Effects on Story Length and Headline Writing:

Copy editors perceived the frequency of story length decisions to be increased because of the VDT. About half the respondents believed there was a noticeable increase in the number of decisions made to measure a story during editing, but a slightly smaller group saw no difference. Convenience was cited as the reason for an increase in decisions to measure, since the computer does the counting for the copy editor, providing a summary of characters, lines, and column inches in just seconds with the press of a key. Another copy editor on the local desk said it is easier to conceptualize story length on paper than on a VDT, resulting in more decisions to measure. The convenience of the body count key encouraged at least one editor to develop a habit of taking more intermediate editing counts after deletions. And another said the body count function helped his editing since the length ordered by a slot editor combined with the body count function meant he could "aim" more accurately when cutting or combining stories. And, he said, this led to an increase in decisions to measure.

From copy editors believing length was affected by the system came two sets of opinions--- that stories are either now shorter or longer. The primary reason stories were perceived to be shorter was explained by the national desk editor, who said editing on the VDT makes it easier to trim stories anywhere in the story instead of from the bottom, which was the not-always-desireable tendency with hot type. The news editor offered a different reason why length may be shorter, stating, "It's a psychological thing that begins with reporters . . . . It is easy to lose track of the length. The very fact that we have instantaneous body count available to us at every stage of the writing and editing process has made us much more conscious of our story lengths, and I think . . . what we're turning into the desks . . . tends to be shorter." Oddly, others argued that because there is no longer "takes" of copy, reporters tend to write longer since they are not aware of length until the story is completed.

One aspect of copy editing which copy editors perceived affected by electronic editing technology is headline writing. Prior to installation of VDTs, copy editors produced headlines with pencil and paper at The Journal but not on typewriters. Copy editors characterized headline writing as easier, simpler, more flexible, better, improved, very different, and more efficient, to use their own terms. The primary reason is speed. An almost unanimous opinion was expressed that headline writing is speeded by VDTs. Most editors attributed this to the headline unit count function of the computer. Because the electronic editing system is programmed to count automatically the unit length of headlines for fit to within a tenth of a unit, the manual aspect of counting is eliminated and made more accurate. Copy editors perceived VDT headline writing as permitting more freedom in experimentation with headlines and counts of words, phrases, line breaks/splits, and so on. With pencil and paper

headline writing, veteran copy editors felt there was less of this approach to headline writing. It is also apparent during copy desk observation that word trials were important, and that headline counting frequently was done by computer. One copy editor said headline writing varies considerably on a VDT from pencil and paper because "you are more willing to try different things because it's a matter of typing the word up there and hitting the count . . . . If you had to go through the long process of counting--- closer to deadlines at least, you might have been afraid to try different variations since it took so long to count . . . . Here you can try five headlines in the space it would take you to count one before." Still other copy editors felt the VDT and computer improved headlines by leading to better fitting headlines over a column and the absence of long headlines which are rejected in the composing room. Since the computer typesetting system is programmed not to accept long headlines, this cannot ordinarily happen any longer.

Research Question 6, Ratio of Local to Non-Local News and the VDT:

Content analysis of The Journal was conducted to determine if the ratio of local news to non-local news changed after the editing system was installed. While it is not an exclusive cause of such a change, an indicator of potential influence in editing priorities would be suggested if a difference were found. Data from the content analysis indicate in Table 1 that 57.03 percent of the newspapers was local content during 1974-76, while 59.31 percent was local during 1976-78. There were no statistically significant increases or decreases

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Table 1 goes about here

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in the total column inches of space for either local or wire news in any of the Main, Local, or Accent sections or in the total for the newspaper after the elec-

TABLE 1

TOTAL WIRE VS. TOTAL LOCAL NEWS SPACE 1974-78

Section	1974-76 Column Inches X (N=12)	Percent Local	1976-78 Column Inches X (N=12)	Percent Local	t-Value[a]	P-Value
Main News						
Local Space	164.00		167.42		0.13	0.90
Wire Space	258.33	38.83	307.17	35.28	2.01	0.06
Local News						
Local Space	192.08		217.08		0.58	0.57
Wire Space	35.23	84.50	58.67	78.72	0.86	0.40
Accent						
Local Space	247.42		260.17		0.21	0.84
Wire Space	108.42	69.53	102.67	71.70	0.19	0.85
Total for Edition[b]						
Local Space	603.50		644.67		0.66	0.51
Wire Space	401.98	60.02	468.51	57.91	1.44	0.17

[a]Two-tailed test.
[b]Totals have been rounded.

tronic editing system was installed. However, wire story space increased from 258.33 column inches to 307.17 column inches per edition, significant at the 0.057 level, in the Main news section. No other changes were attributable to any factor other than chance. The proportions of local space to wire space remained relatively constant, with wire news dominating the Main news section, and local news dominating the Local and Accent sections during both the pre-VDT and post-VDT periods.

Copy editors perceived no change in the proportion of wire news to local news in interviews, consistent with the content analysis data. About half of the two dozen copy editors with experience editing with hard copy and on VDTs at The Journal responded that there was no change in the balance of local to wire news. Those remaining clearly indicated there might be a slight change favoring more local news since 1976, but stated this was not due to the electronic editing system as much as to changes in editorial policy making-- primarily a decision to publish zoned editions of the Accent section.

A related consideration is the number of insertions of wire stories with local material. Content analysis data on this aspect of editing are presented in Table 2, and show that there is no statistically significant difference in the number of wire stories containing local insertions. Overall, the 1976-78 issues contained a mean of 0.39 insertions per issue. While this is an increase over the average of 0.26 insertions per issue during 1974-76, it is no different than results obtainable by chance. A further breakdown by major news sections revealed

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Table 2 goes about here

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non-significant findings also, despite two of the three sections increasing in frequency. The third section remained unchanged.

TABLE 2

FREQUENCY OF INSERTIONS[a] IN WIRE STORIES, TOTAL STORIES

Section	1974-76 Frequency X (N=53)	1976-78 Frequency X (N=52)	t-Value	P-Value[b]
Main News				
Total Stories	58.66	53.88	2.20	0.03*
Wire Stories	43.66	42.04	0.88	0.38
Inserted Wire	0.21	0.31	0.79	0.43
Local News				
Total Stories	31.02	31.19	0.65	0.95
Wire Stories	5.79	6.56	0.94	0.35
Inserted Wire	0.38	0.58	0.40	0.69
Accent				
Total Stories	29.16	33.38	1.57	0.12
Wire Stories	11.34	10.98	0.27	0.79
Inserted Wire	0.19	0.19	0.13	0.99
Total for Edition[c]				
Total Stories	120.67	118.31	0.47	0.64
Wire Stories	60.67	59.57	0.41	0.69
Inserted Wire	0.26	0.39	0.86	0.39

[a]An insertion in a wire story was operationally defined as an addition to a wire story originating locally containing a Milwaukee area approach to the story. The insertion could be placed at any point in the story.

[b]Two-tailed test.

[c]Totals have been rounded.

Copy editors, when interviewed, presented impressions consistent with data in the content analysis. This indicates that despite the additional convenience for insertions afforded by VDTs, there had been no change in editing behavior.

Research Question 7, VDTs and Number and Type of Judgment Decisions: Copy editors interviewed perceived no particular effect upon news judgment decisions caused by their editing and use of an electronic editing system. Two general questions to determine what criteria were used in the news selection process and the frequency of such decisions, but among the considerations mentioned by editors were many of the traditional criteria discussed in the literature on news judgment, but not technological considerations. Only three copy editors mentioned the editing system at all, and these individuals said it was only a minor influence. The frequency of decisions made about stories while editing did not appear to be influenced by the editing system, copy editors stated. However, it should be noted that several copy editors expressed the feeling that VDTs facilitated news judgments and they were making more decisions because of added conveniences of the system, because, as one said, "you are capable of doing more (judgmental decisions) . . . . You can choose which (story) is best, rearrange; you can certainly recast a whole story without difficulty."

Research Question 8, Changes in Accuracy in Editing: There was almost unanimous agreement that the electronic editing system has brought a reduction in the number of errors in published copy, interviewing determined. While many of the copy editors were able to attribute the reduction to the simplification of the typesetting system---capturing the original keystroke of the reporter and elimination of the additional keypunching and resultant additional errors in composition--- others noted that the system had led to improvement in their own

work as well. There were several copy editors interviewed who believed that the electronic editing system has led to an increase in the number of errors in copy. But this small group noted only the potential for such an increase, stating that the system lends itself to additional editing, thus more errors. Another pointed out the minor additional consideration--- admittedly, he said, not a major problem--- that at certain times of the year typographic errors will result from extraneous characters appearing in the system due to such factors as static electricity.

In terms of editing quality, copy editors interviewed perceived no effect of the electronic editing system on their editing skills. Copy editors noted, in general, that their editing skills on deadline were not affected by VDTs after the initial intimidation passed. While the initial adjustment was a negative influence, as noted earlier, editors said this diversion was short-lived. Similarly, editors did not perceive any change in editing quality under deadline pressure. Several were critical of the proofreading which had to be done, stating that she had been reduced from a copy editor to proofreader, slowing her down even more.

Research Question 9, Change in Editing Speed with the VDT: Certainly one of the earliest questions of the impact of electronic technology on editing found in the literature is relative to speed. What did copy editors perceive regarding speed? What were the most commonly cited reasons for the response?

Copy editors at The Journal were divided, as was the literature, on whether VDTs increase editing speed, reduce it, or have no measureable effect. Slightly more editors felt the VDT slowed editing than those who felt it increased editing speed, but a large third group felt there was no difference or found a response difficult to provide the interviewer.

The group believing that speed was increased cited a number of mechanical reasons for the time savings, such as elimination of cutting and pasting of hard copy, the improved typing on the VDT keyboard, and gained speed in headline writing through automatic counting.

The group arguing that speed was decreased said that there was simply more required of an editor with an electronic editing system. Specifically, reasons included greater physical effort, more care due to final editing and composition commands and proofreading, a tendency to cut throughout the story rather than from the bottom, machine delays in response to commands, inability to see an entire story at a single glance and the resultant scrolling efforts on the screen, and a general "cumbersomeness" of the VDT.

Finally, those who argued that the system did not change speed pointed out their perceptions that these plusses and minuses balanced each other out in the long run.

In a more general sense, editing time was also affected by the electronic editing system. Deadline changes resulted from installation of the new system, as Managing Editor Joseph Shoquist stated:

> We converted from hot type some months prior to the start up of the Hendrix system. We knew that we had to do that to get the full advantage . . . That cost us a half hour on deadline. That's because of the time required to engrave a page. We had to do it . . . because you don't get the error-free advantage of the electronics if you're still in hot type because the (linotype) machines themselves have an error rate that's very high even though they were automated. The photo-comp doesn't make errors, period. . . . We expected we would regain that lost half hour with the electronics. We did regain most of it, not quite all of it. We officially gained fifteen minutes on our declared deadline time. And we stuck with that until recently. I think we regained much closer to thirty minutes in actual practice because after the VDT system began operating we made our deadlines. We never did it before---hardly ever.[36]

Discussion and Conclusions

Clearly, there are a number of aspects of electronic editing and decision making of copy editors which are not addressed in this study. Such editing tasks as rewriting, heavy versus light editing of a story, availability of hard copy during electronic editing, for example, as well as numerous others must be addressed. Some have been elsewhere.[37] Others must be the focus of new research on electronic reporting and editing systems as we come to understand the full impact of this technology on gatekeeping and gatekeeper decision making.

Perhaps this project generated more questions than it answered. This, of course, is not unusual in searching for solutions to communication problems.

The major conclusions from this case study, as determined from the findings presented here, are:

(1) Copy editing is done in much the same way with a VDT system than with pencil and paper. Decision making of editors does not have to be significantly altered if an electronic reporting and editing system is designed for the copy editor. The tendency is too often for copy editors to alter their work to meet the needs of an electronic editing system, but this study shows it is not necessary.

(2) Adaptation and adjustment to an electronic editing system by copy editors does not have to require a lengthy period. If a system is designed properly, there is only a brief period of time which is necessary for regular full-time copy editors to become familiar with the hardware and resume their work in their normal pattern of behavior. In this study, the adjustment period was likely to be a few weeks at most, a few days at least.

(3) The electronic editing system computer has contributed to the editing process by reducing routine tasks such as headline and story counting, but these conveniences do not appear to have an effect upon the ratios of local news to wire, or non-local news.

(4) Except during the adjustment period, the electronic editing system does not appear to be a factor in news judgments and decision-making behavior of gatekeepers. Other, more traditional, factors in judging and evaluating news seem to retain their roles in the process of making news.

(5) While accuracy seems to be enhanced by electronic editing systems and photocomposition hardware, the issue of editing speed remains unresolved by the findings of this study. This remains a matter of experimentation and investigation in future research in electronic editing and VDT use.

Broader, more sweeping research must be conducted on the impact of the technology to achieve what Wolton stated about the changing communications world. Does technology change everything, change nothing, or is its impact felt somewhere in between?

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